REMARKS

This Amendment is filed in response to the Office Action dated April 7, 2005, which has a shortened statutory period set to expire July 7, 2005.

Claims 1-12, 48-52, and 55-56 Are Patentable Over Nowak

As taught by Applicants in the Specification (emphasis added) with reference to Figure 2:

> [0008] During the mask design process, dummy features 203-204 are added after the layout design of main features 201-202. **Of importance, a GDS-II file for a mask layer can include multi-level information, thereby allowing main features 201-202 to be distinguishable from dummy features 203-204. However, this design information can then be mapped into a mask data preparation (MDP) language, which is a one-level file.** In one embodiment, this mapping can be performed by the CATS™ tool, which is licensed by the assignee of the invention. **Thus, after layout, dummy features 203-204 and main features 201-202 are effectively treated as one type of data. As a consequence, post-layout processing is applied globally to all features including the dummy features instead of selectively to only the main features.** Examples of post-layout processes can include optical proximity correction (OPC), placement of phase shifting structures, mask writing, mask fabrication, mask inspection, and mask defect correction.
>
> [0009] **Applying such post-layout processes globally can result in wasted resources and cycle time. In some cases, unnecessary processing of dummy or other less important features can take up a significant portion or even the majority of the manufacturing cycle.** Therefore, a need arises for a system and method of identifying features on a mask layer for post-layout processing.
>
> [0010] In accordance with one feature of the invention, **dummy features can be distinguished from main features using various automated techniques. These techniques can be advantageously applied to any post-layout mask process when dummy features are not separated from the main features in data**

representation. In general, a method of distinguishing a dummy feature from a main feature includes selecting a mask layer, providing a technique to identify the dummy feature on the mask layer, and applying the technique to the selected mask layer. **The technique can be based on information from multiple mask layers or geometric information from the selected mask layer.**

[0011] In a multiple mask layer technique, the information can include connectivity between the selected mask layer and the other mask layer(s). In one embodiment, this connectivity information can be provided by a contact or via layer. The information can also include a functional association between the selected mask layer and the other mask layer(s). For example, functional association information can be provided by a polysilicon layer and a diffusion layer.

[0012] In a geometric technique, the information can include determining a size or a shape of a feature, wherein the dummy/main feature can have a size greater than a predetermined size or can have a predetermined shape. In another case, dummy/main features can have a predetermined pattern, i.e. a certain shape and inter-feature spacing. In yet another case, a dummy/main feature can have a set proximity to another feature on the same layer.

In contrast, Nowak teaches a method of increasing planarity of a processing layer by **generating** a dummy fill pattern. Col. 1, lines 57-60 and col. 2, lines 8-9 and 15-28. The problem addressed by Applicants occurs **after** the dummy fill pattern is combined with the original layer, e.g. after step 16 (the final step) taught by Nowak. Therefore, Applicants respectfully submit that Nowak fails to teach anything about **distinguishing** dummy features from main features.

Claim 1 recites:

> A method of distinguishing a dummy feature from a main feature, the method comprising:
> selecting a mask layer;

providing a technique to identify the dummy feature on the mask layer generated with a one-level file; and

applying the technique to the selected mask layer.

Because Nowak fails to disclose or suggest distinguishing a dummy feature from a main feature, and specifically providing a technique to identify the dummy feature on the mask layer generated with a one-level file, Applicants request reconsideration and withdrawal of the rejection of Claim 1.

Claims 2-5 depend from Claim 1 and therefore are patentable for at least the reasons presented for Claim 1. Based on those reasons, Applicants also request reconsideration and withdrawal of the rejection of Claims 2-5.

Claim 6 recites in part:

An automated method of processing a mask layer for manufacturing an integrated circuit, the automated method comprising:

identifying a plurality of main features and at least one dummy feature in the mask layer generated with a one-level file; and

providing the processing only to the plurality of main features.

Because Nowak fails to disclose or suggest identifying a plurality of main features and at least one dummy feature in the mask layer generated with a one-level file as well as providing the processing only to the plurality of main features, Applicants request reconsideration and withdrawal of the rejection of Claim 6.

Claims 7-12 depend from Claim 6 and therefore are patentable for at least the reasons presented for Claim 6. Based on those reasons, Applicants also request reconsideration and withdrawal of the rejection of Claims 7-12.

Claim 48 recites:

> A method of inspecting a mask for defects, the mask including a plurality of features, the method comprising:
> reading a mask data preparation format file, the mask data preparation file being a one-level file;
> identifying dummy versus non—dummy features using the mask data preparation format file; and
> inspecting only non—dummy features.

Because Nowak fails to disclose or suggest reading a mask data preparation format file (the mask data preparation file being a one-level file), identifying dummy versus non—dummy features using the mask data preparation format file, and inspecting only non—dummy features, Applicants request reconsideration and withdrawal of the rejection of Claim 48.

Claims 49-52 depend from Claim 48 and therefore are patentable for at least the reasons presented for Claim 48. Based on those reasons, Applicants also request reconsideration and withdrawal of the rejection of Claims 49-52.

Claim 55 recites:

> A method of conserving resources in a computer system during optical proximity correction (OPC) of a layout of an integrated circuit (IC), the method comprising:
> identifying dummy versus non—dummy features from the layout, wherein dummy and non-dummy features are not separated in data representation; and
> expending resources for OPC only on non-dummy features.

Because Nowak fails to disclose or suggest identifying dummy versus non—dummy features from the layout (wherein dummy and non-dummy features are not separated in data representation)

and expending resources for OPC only on non-dummy features, Applicants request reconsideration and withdrawal of the rejection of Claim 55.

Claim 56 depends from Claim 55 and therefore is patentable for at least the reasons presented for Claim 55. Based on those reasons, Applicants also request reconsideration and withdrawal of the rejection of Claim 56.

CONCLUSION

Claims 1-12, 48-52, and 55-56 are pending in the present application. Allowance of these claims is respectfully requested.

If there are any questions, please telephone the undersigned at 408-451-5907 to expedite prosecution of this case.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 3, 2005.

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Date

Signature: Rebecca A. Baumann